

Described is a method for examining a surface of a sample using an atomic force scanning microscope (AFM) comprising a cantilever with a longitudinal extension along which a measuring tip is disposed, which is selectively arranged relative to said sample surface by a driver means and whose spatial position is detected using a sensor unit, and said microscope is provided with at least one ultrasound generator, which initiates vibration excitation at a given excitation frequency between said sample surface and said cantilever, the measuring tip of which is brought into contact with said sample surface in such a manner that said measuring tip is excited to vibrations which are oriented lateral to said sample surface and perpendicular to said longitudinal extension of said cantilever and that the torsional vibrations induced in said cantilever are detected and analyzed by means of an evaluation unit. The invention is distinguished in that the vibration excitation occurs in such a manner that the oscillations executed by the measuring tip have higher harmonic vibration parts relative to the excitation frequency, that vibration excitation is conducted at excitation amplitudes which lead inside the cantilever to torsional amplitudes, the maximum values of which form a largely constant plateau value despite increasing excitation amplitudes and the resonance spectra of which undergo, in the range of the maximum values of the torsional amplitudes, a widening of the resonance spectrum which is determinable by a plateau width, and that used for examining the sample surface are the resonance spectra, preferably the plateau value, the plateau width and/or the gradient of the respective resonance spectra.